

What is claimed is:

1. A mask correction method, in a correction process for removing redundant sections such as photomask opaque defects or phase shifter bump defects, comprising the steps of:

coarse correction by etching using a focused ion beam; and
finishing correction by etching using an electron beam.

2. The mask correction method of claim 1, comprising, before the coarse correction, a step of acquiring an SEM image using an electron beam, and a step of positioning defect correction locations on the SEM image.

3. The mask correction method of claim 1, wherein the finishing processing using an electron beam is carried out while spraying etching assist gas to a beam irradiation position.

4. The mask correction method of claim 1, wherein the coarse correction is carried out to leave part of the defect, and finishing processing is performed on the remaining part.

5. The mask correction method of claim 1, wherein, when the defect is an opaque defect, the coarse correction removes the entire opaque defect.

6. The mask correction method of claim 5, wherein secondary ions generated at the time of coarse correction are detected and the coarse correction is stopped when the material of the secondary ions changes, and finishing correction is then carried out by removing damage that occurred at the time of coarse correction using an electron beam.

7. A composite charged particle beam device for mask correction, comprising:

a focused ion beam lens barrel fitted inside a sample chamber and an electron beam lens barrel capable of irradiating a powerful beam for processing; and

a gas introduction unit for spraying CVD source material gas or etching assist gas to beam irradiation positions from each of the lens barrels.

8. The composite charged particle beam device for mask correction of claim 7, further comprising a secondary electron detector capable of discriminately detecting secondary electrons and secondary ions, for monitoring processing state.

9. The composite charged particle beam device for mask correction of claim 7, wherein the electron beam lens barrel obtains a beam current value of from a few pA to a number of tens of pA, and obtains a current value of a number of nA.